Claims

[c1]   What is claimed is:

1.A method of detecting inter-carrier-symbol interference (ICSI) of a symbol for adjusting a boundary of the symbol utilized by an OFDM system, wherein each symbol includes a plurality of signals respectively transmitting via a plurality of sub-carriers, the method comprising:

computing a first correlation value representing the correlation between at least one of first signals of a first symbol and at least one of second signals of a second symbol previous to the first symbol, wherein the at least one first signal is transmitted via a first sub-carrier and the at least one second signal is transmitted via a second sub-carrier adjacent to the first sub-carrier;

computing a second correlation value representing the correlation between the at least one first signal and at least one of third signals of a third symbol next to the first symbol, wherein the at least one first signal is transmitted via the first sub-carrier and the at least one third signal is transmitted via the second sub-carrier;

comparing the first correlation value with the second correlation value; and

adjusting the timing of the boundary according to the comparison result.

[c2]   2.The method of claim 1, wherein the signals include a plurality of pilot signals and a plurality of data signals.

[c3]   3.The method of claim 1, wherein the step of computing the first correlation value comprises:
computing a conjugated value of the at least one first signal;
multiplying the conjugated at least one first signal by the corresponding one of the second signals for generating a product value; and
generating the first correlation value according to the summation of the product value.

[c4]   4.The method of claim 3, wherein the first correlation value is generated according to the summation of the absolute value of the product value.

[c5]   5.The method of claim 3, wherein the first correlation value is generated according to the summation of the square value of the product value.

[c6]   6.The method of claim 1, wherein the step of computing the second correlation value comprises:
computing a conjugated value of the at least one first signal;

multiplying the conjugated at least one first signal by the corresponding one of the third signals for generating a product value; and

generating the second correlation value according to the summation of the product value.

[c7]   7.The method of claim 6, wherein the second correlation value is generated according to the summation of the absolute value of the product value.

[c8]   8.The method of claim 6, wherein the second correlation value is generated according to the summation of the square value of the product value.

[c9]   9. The method of claim 1, wherein method further comprises:

equalizing and slicing the second symbol for generating the at least one second signal; and

equalizing and slicing the third symbol for generating the at least one third signal.

[c10]   10. An apparatus of detecting inter-carrier-symbol interference (ICSI) of a symbol for adjusting a boundary of the symbol utilized by an OFDM system, wherein each symbol includes a plurality of signals respectively transmitting via a plurality of sub-carriers, the apparatus comprising:

a first correlator for computing a first correlation value representing the correlation between at least one of first signals of a first symbol and at least one of second signals of a second symbol previous to the first symbol, wherein the at least one first signal is transmitted via a first sub-carrier and the at least one second signal is transmitted via a second sub-carrier adjacent to the first sub-carriers;

a second correlator for computing a second correlation value representing the correlation between the at least one first signal and at least one of third signals of a third symbol next to the first symbol, wherein the at least one first signal is transmitted via the first sub-carrier and the at least one third signal is transmitted via the second sub-carrier;

a comparator for comparing the first correlation value with the second correlation value; and

a timing controller for adjusting the timing of the boundary according to the comparison result.

[c11]   11.The apparatus of claim 10, wherein the signals include a plurality of pilot signals and a plurality of data signals.

[c12]   12.The apparatus of claim 11, wherein the first correlator further comprises:

a conjugating unit for computing a conjugated value of

the at least one first signal;

a multiplying unit for multiplying the conjugated at least one first signal by the at least one second signal for generating a product value; and

a correlation value computer for generating the first correlation value according to the product value.

[c13]   13.The apparatus of claim 12, wherein the correlation value computer comprises:

a absolute value calculating unit for calculating the absolute value of each of the product values; and

a summation unit for calculating the sum of the absolute value of the product values.

[c14]   14.The apparatus of claim 12, wherein the correlation value computer comprises:

a square value calculating unit for calculating the square value of each of the product values; and

a summation unit for calculating the sum of the square value of the product values.

[c15]   15.The apparatus of claim 10, wherein the second correlator further comprises:

a conjugating unit for computing a conjugated value of the at least one first signal;

a multiplying unit for multiplying the conjugated at least one first signal by the at least one third signal for gener-

ating a product value; and

a correlation value computer for generating the second correlation value according to the product value.

[c16] 16. The apparatus of claim 15, wherein the correlation value computer comprises:

a absolute value calculating unit for calculating the absolute value of each of the product values; and

a summation unit for calculating the sum of the absolute value of the product values.

[c17] 17. The apparatus of claim 15, wherein the correlation value computer comprises:

a square value calculating unit for calculating the square value of each of the product values; and

a summation unit for calculating the sum of the square value of the product values.

[c18] 18. The apparatus of claim 10, wherein the apparatus further comprises:

a first equalizer for equalizing the second symbol;

a first slicer coupled to the first correlator for slicing the equalized second symbol and generating the at least one second signal;

a second equalizer for equalizing the third symbol; and

a second slicer coupled to the second correlator for slicing the equalized third symbol and generating the at

least one third signal;